

RENEWABLE ENERGY TRENDS AND SUPPORT POLICIES



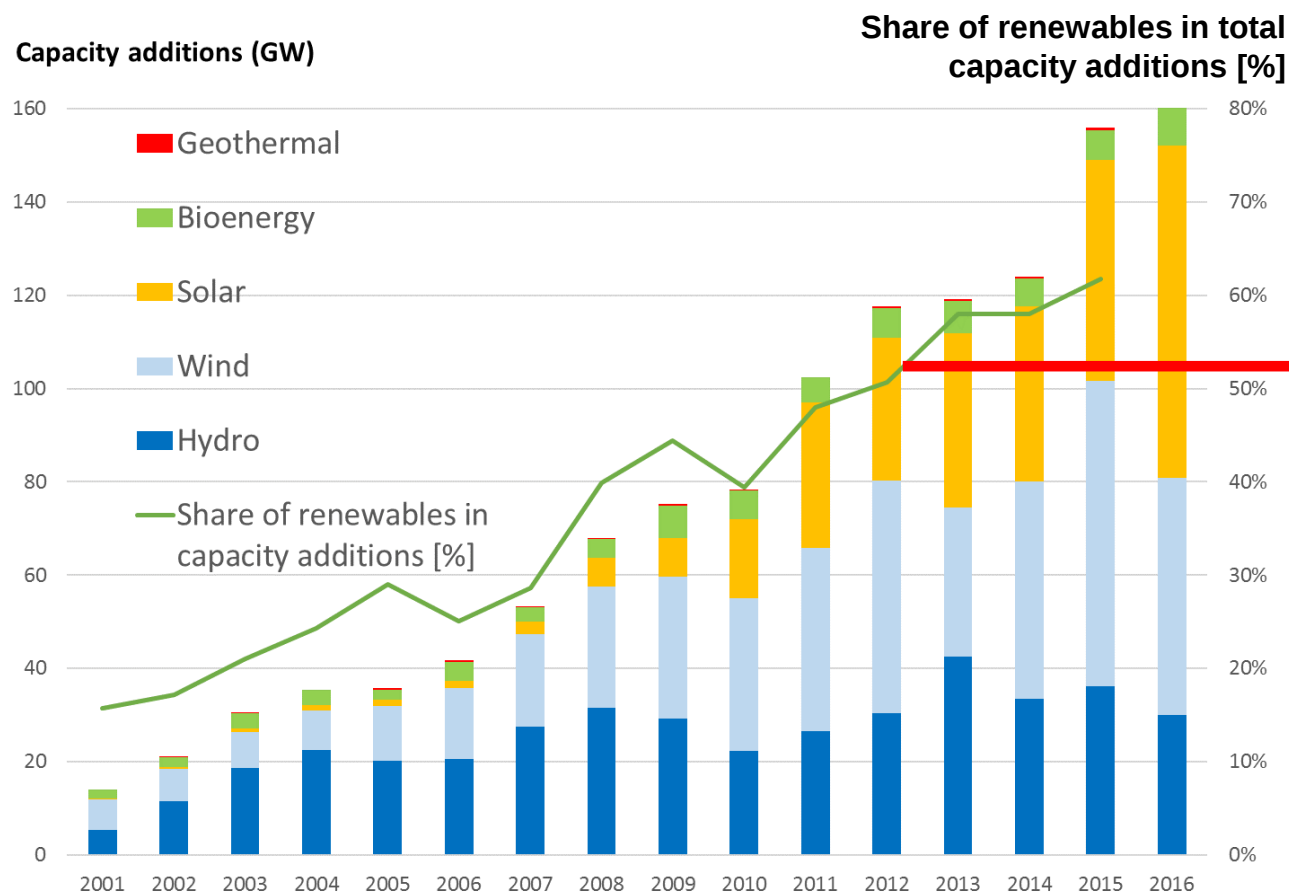
Dolf Gielen, Director Innovation and Technology

21st session of the United Nations Commission on Science and Technology for Development (CSTD), Geneva, 14-18 May 2018

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On-going power sector transformation



Source: IRENA statistics

Since 2012 >50% of total capacity additions

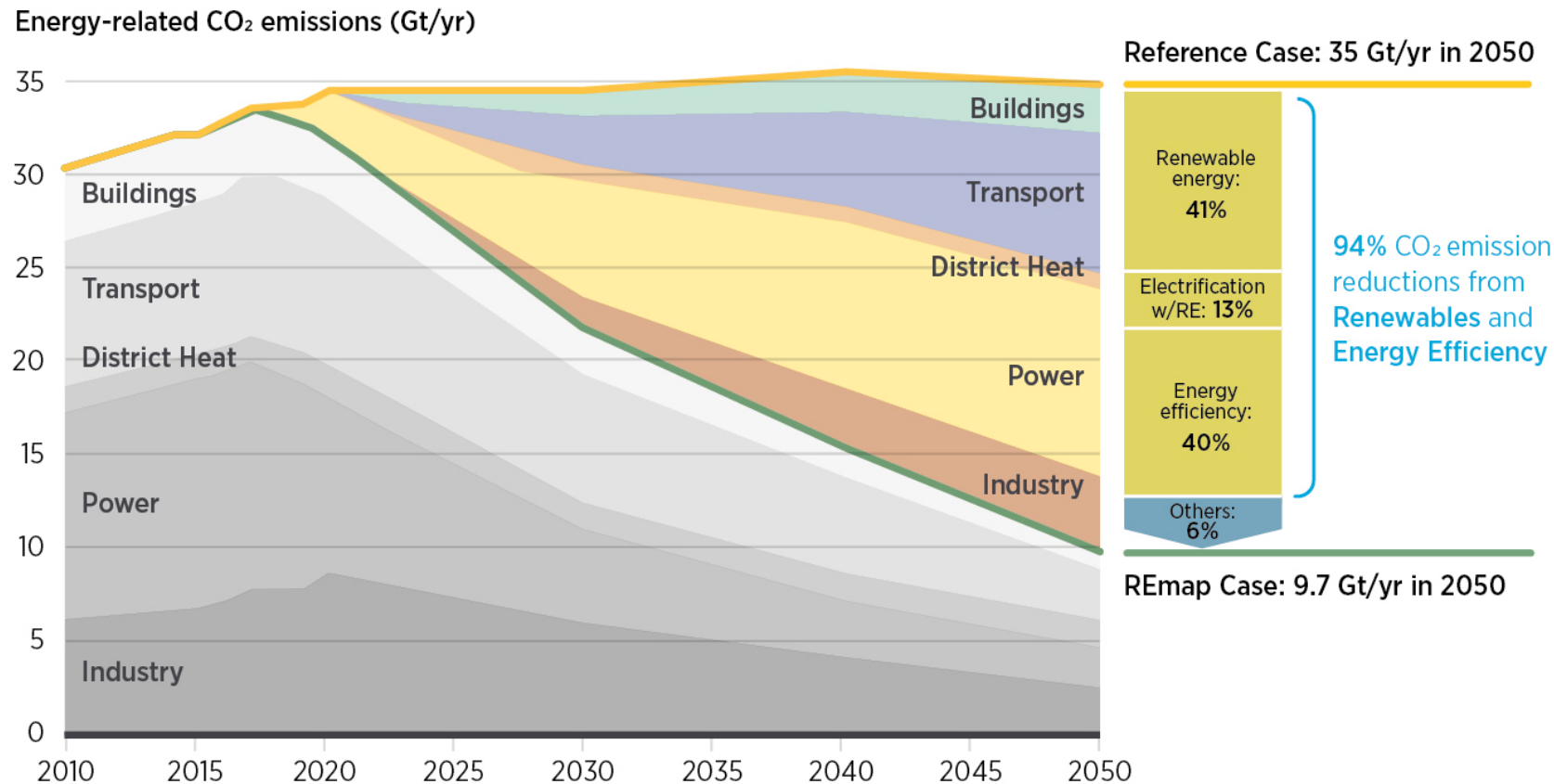
2017

- 167 GW added globally
- 94 GW solar PV
- 47 GW wind
- 3 GW biomass

- Around 25% renewable power generation share worldwide
- Growing by 0.7 percentage points per year

Renewable energy and energy efficiency can provide over 90% of the reduction in energy-related CO₂

Annual energy-related CO₂ emissions and reductions, 2015-2050



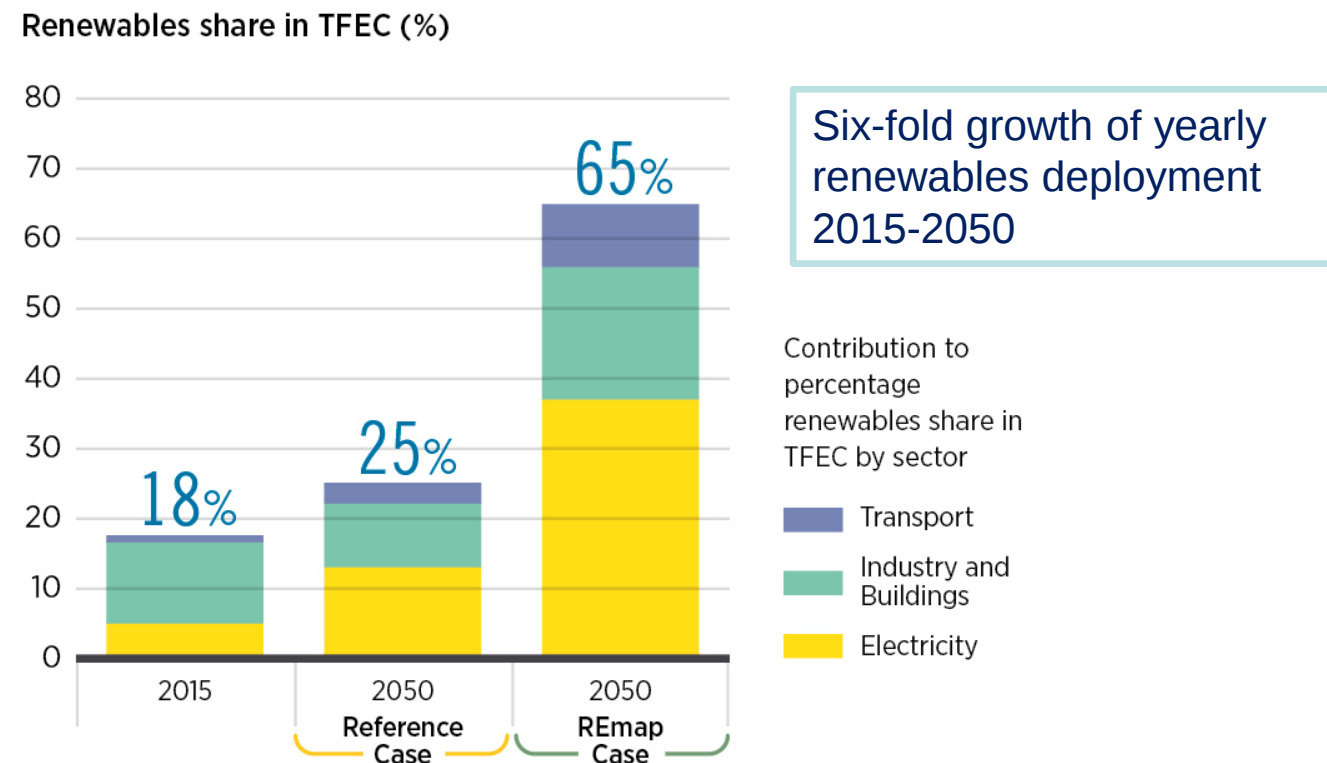
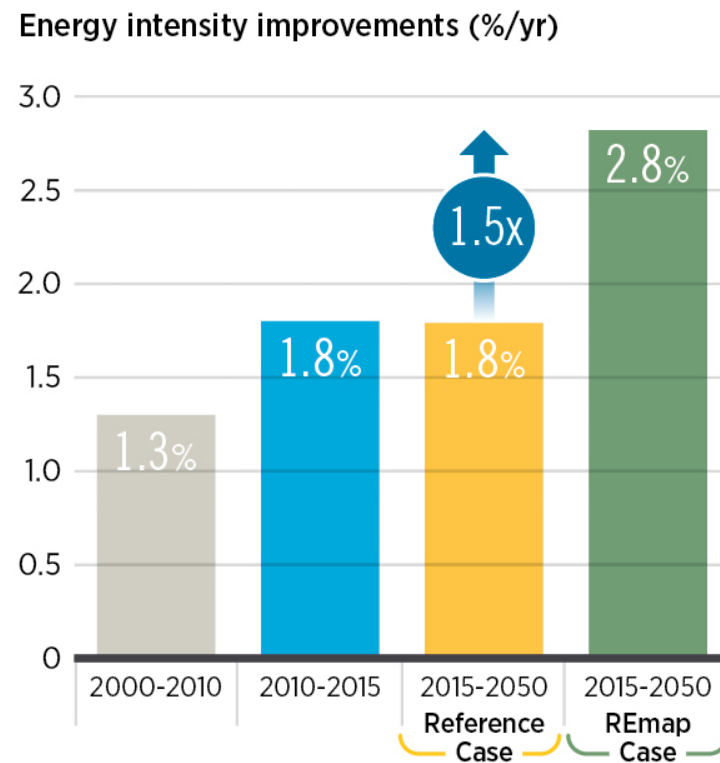
An upper limit of 2 degrees with a 2/3 chance of success:

790 Gt energy CO₂ emissions budget 2015-2100

Annual energy-related emissions are expected to remain flat (under current policies in the Reference Case) but must be reduced by over 70% to bring temperature rise to below the 2° C goal. Renewable energy and energy efficiency measures provide over 90% of the reduction required.

Significant improvements in energy intensity are needed and the share of renewable energy must rise

Energy intensity improvement rate and renewable energy share in TFEC, Reference and REmap cases

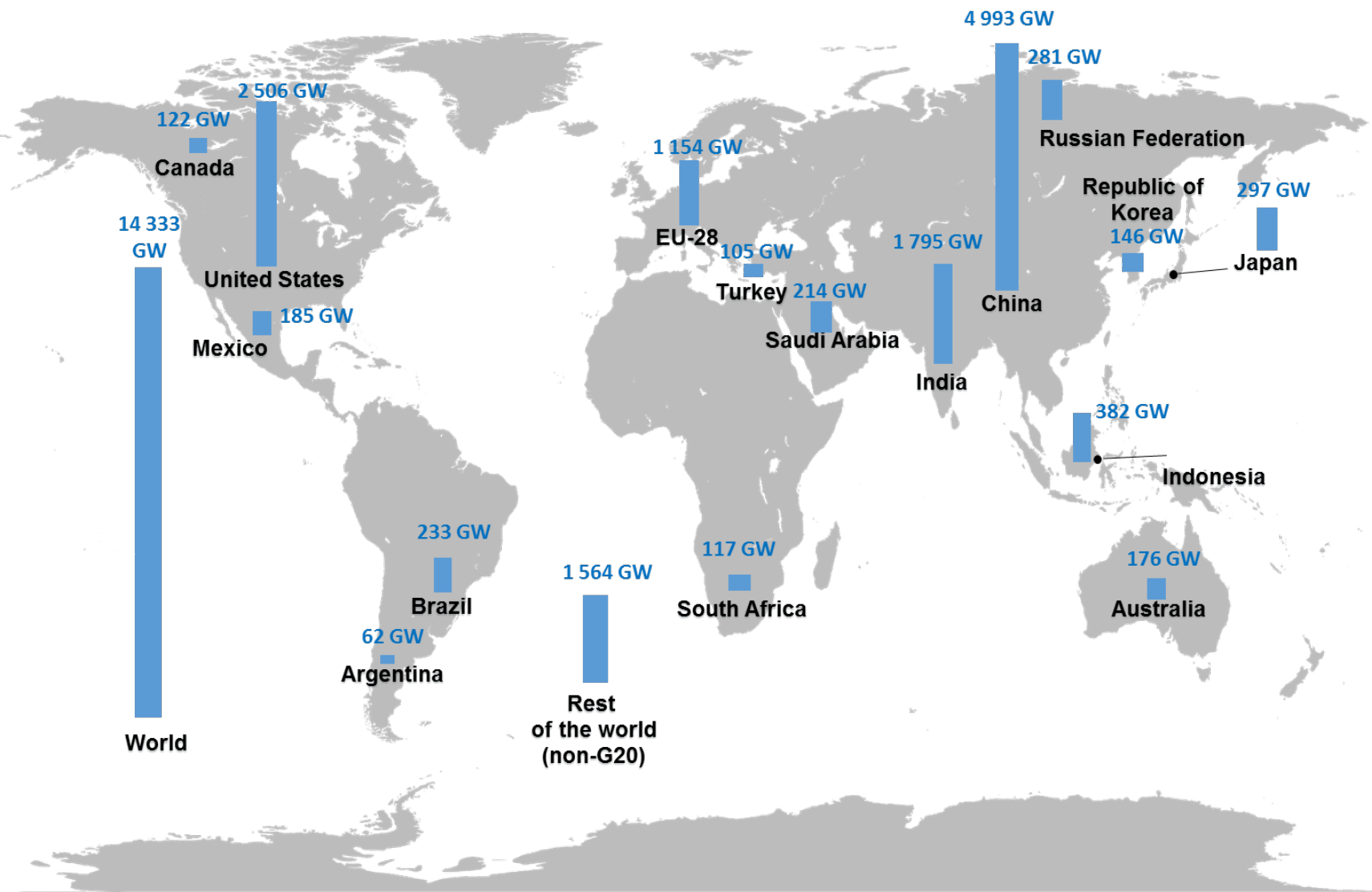


Source: Historical energy intensity improvement values from (SE4ALL, 2016), projections based on IRENA analysis

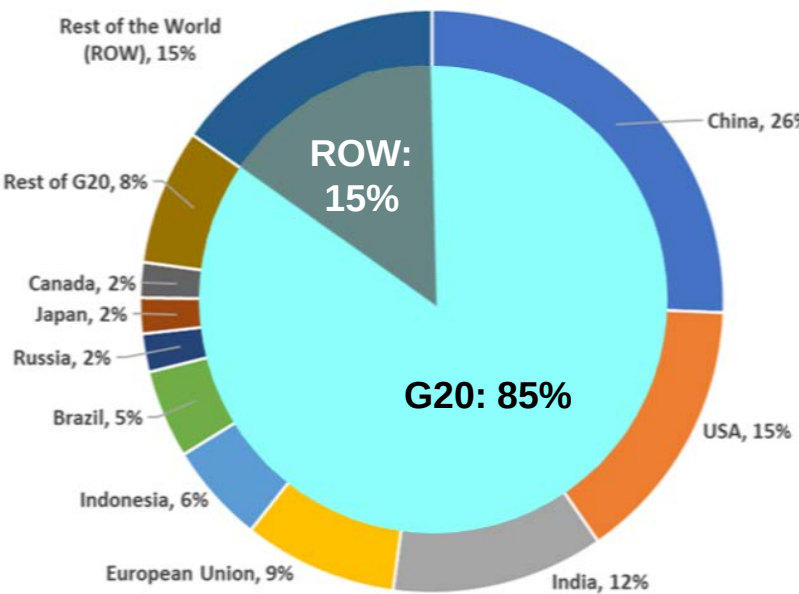
Both renewable energy and energy efficiency are at the heart of the energy transition and climate goals. By 2050 action in both areas must be scaled up considerably.

Renewable power additions and contributions to RE in T FEC

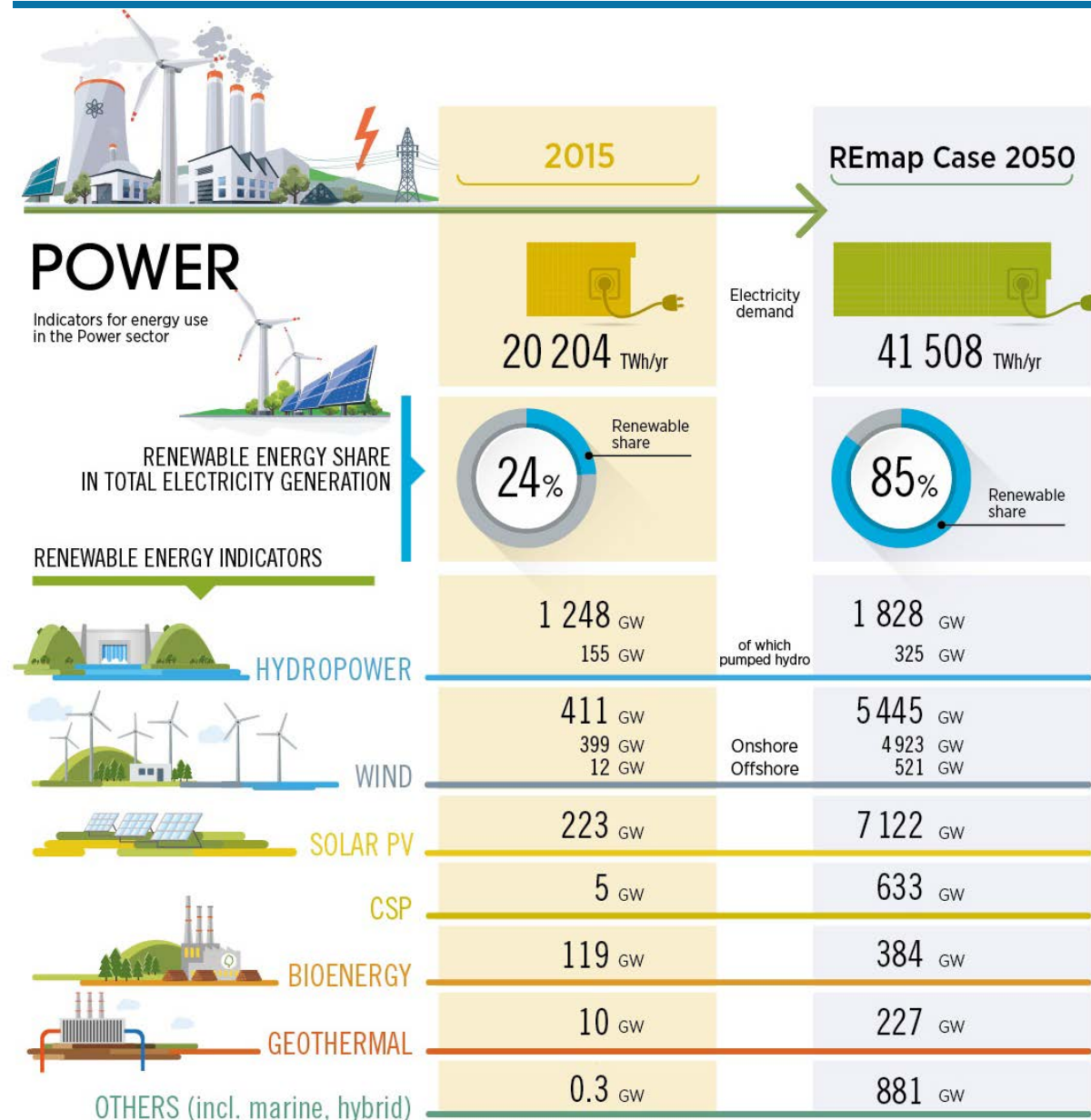
Renewable power capacity additions, REmap Global Energy Transition Case, to 2050



Contributions to total global renewables consumed in T FEC, in 2050



Energy use indicators in Power



INVESTMENT

Total investments for decarbonisation for the period 2015-2050



→ **POWER GENERATION**
24.6 USD trillion

→ **POWER SYSTEM FLEXIBILITY AND GRID***
18 USD trillion

* This includes investments needed for transmission and distribution grid expansion, increased generation flexibility, electricity storage.

STRANDED ASSETS

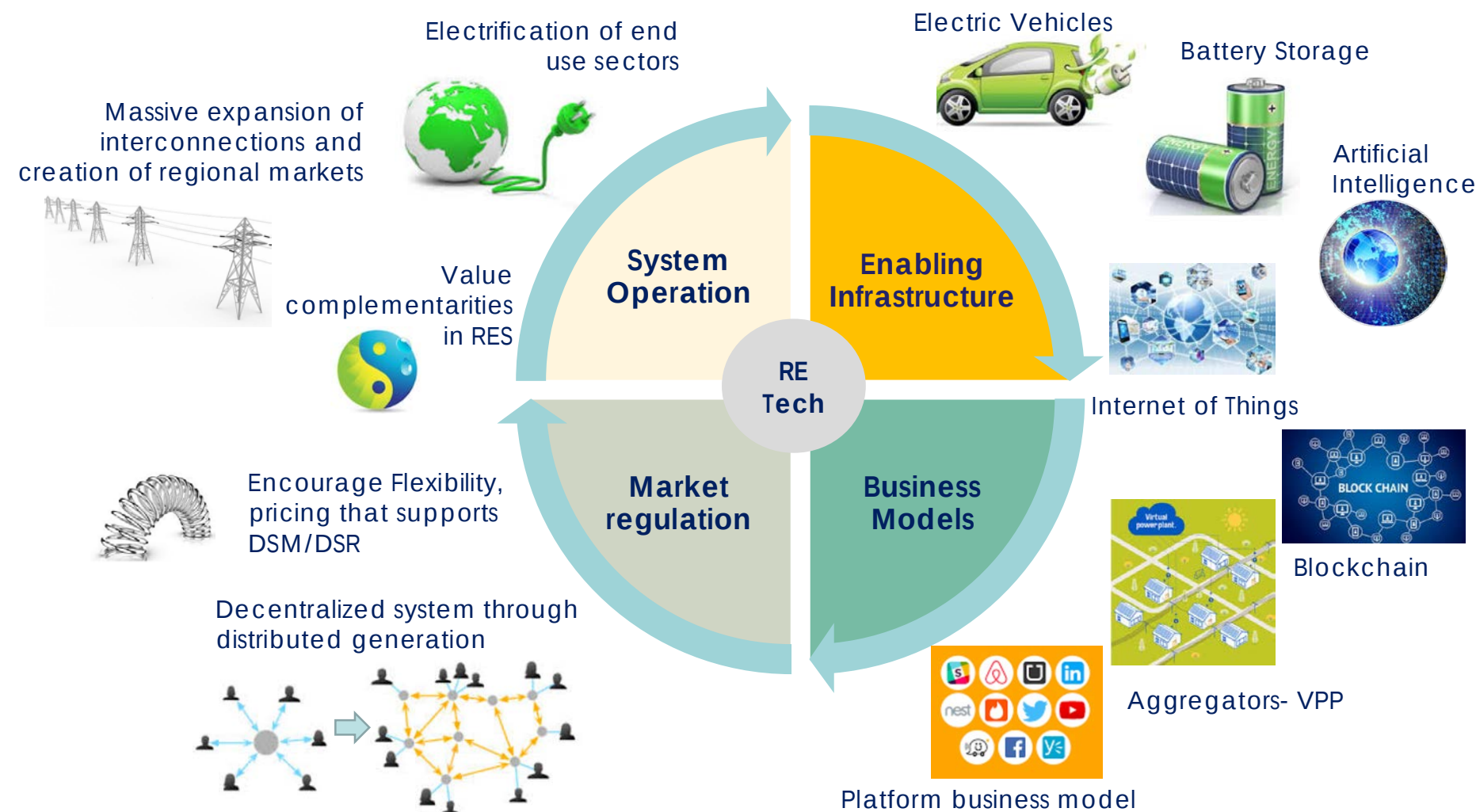
for the period 2015-2050

Delayed Policy Action
1.4 USD trillion

REmap Case 2050
1 USD trillion

Emerging Innovations in Power

A Combination of Affordable RE Technologies, Digitalisation and Climate Change Policies is driving change – IRENA Innovation Landscape Assessment ongoing



Innovation trends for the future power system

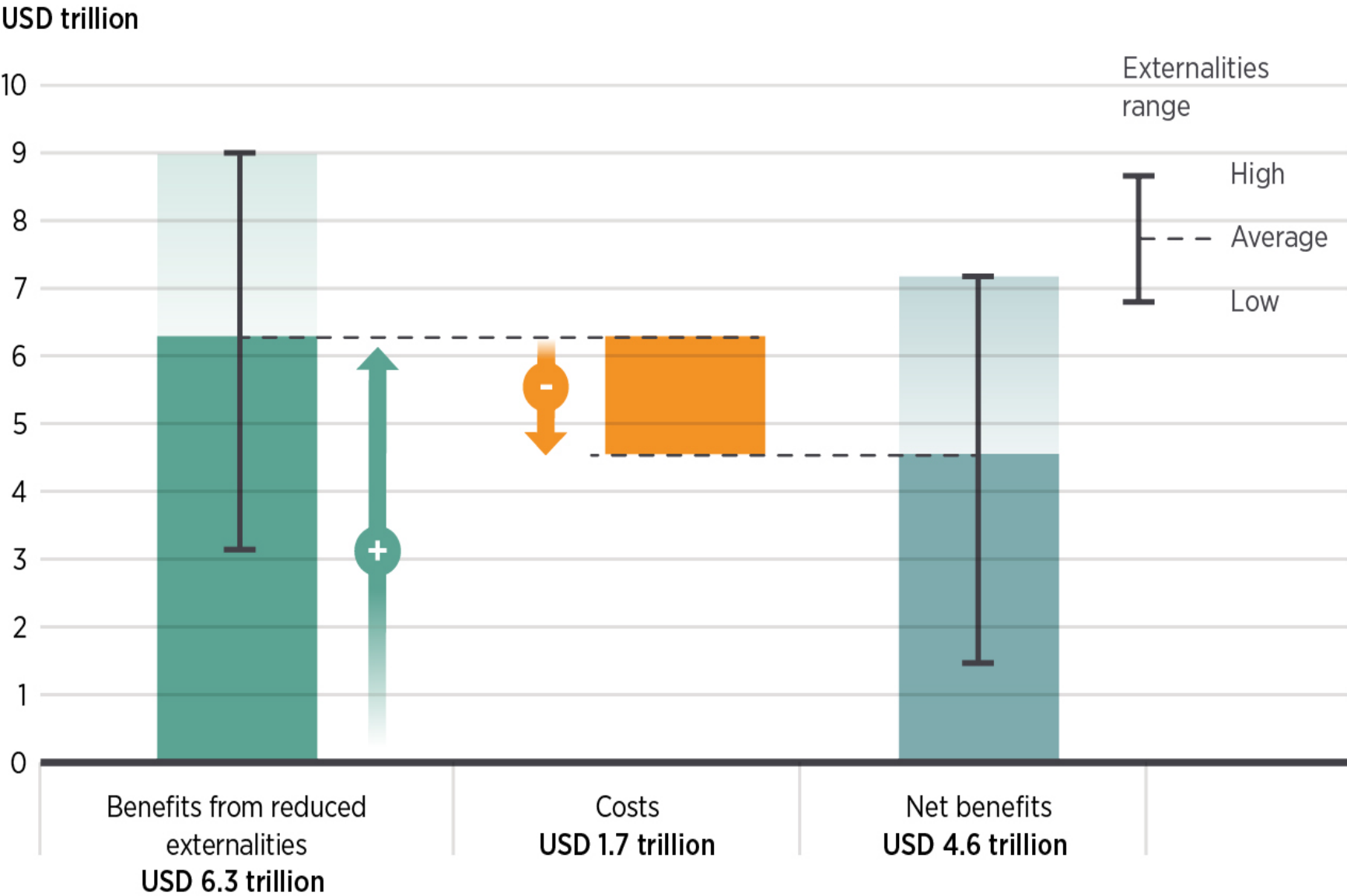
Digitalisation

Decentralisation and Democratisation

Flexible System

Electrification of other sectors

Benefits far outweigh the costs of a global energy transformation



Macroeconomic impacts

USD 27 trln cumulative additional energy investments

1% GDP increase by 2050

11 mln additional jobs by 2050





To know more about the **Global Energy Transformation**, this and other IRENA publications are available for download from **www.irena.org/publications**

For further information or to provide feedback, please contact IRENA at **info@irena.org**

For further information or to provide feedback on the socio-economic analysis please contact the Policy team at **policy@irena.org**, on the REmap analysis please contact the REmap team at **remap@irena.org**



- The acceleration envisaged in the REmap Case would significantly transform the global energy system.
 - » Flat energy demand - the energy intensity of the global economy would need to fall by about two-thirds by 2050, a decline of 2.8% per year.
 - » The total share of renewable energy must rise from around 15% of TPES in 2015 to around 66% in 2050.
 - » A decarbonized power sector - 85% of electricity generation is from renewable sources including 60% variable renewables.
 - » Electrification of end use - the share of electricity rises to 40% of TFEC.
 - » Modern bioenergy can play a vital role in the energy transition if scaled up significantly – doubling of bioenergy use – notably liquid biofuels, feedstock and industrial use.

Renewable Energy Prospects for the European Union: The outlook is brightening



February 2018

Aim

- Identify options to meet and potentially exceed the proposed 27% renewables target for 2030.
- Assess the aggregated impact of national renewable energy plans.
- Assess the role of renewables in long-term decarbonization.

Insights

- Doubling the RE share is feasible between now and 2030 to a 34% RE share.
- This is cost neutral and creates substantial economic and social benefits.
- RE technology improvements in recent years are the driver for greater potential.
- Accelerating renewable deployment will be key for Europe to be in line with Paris Agreement.

Follow-up

- Expansion for all South-East European Energy Community members
- Dialogue and deepening of the analysis for EU members (including Finland)